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(54) Title: FUEL CELL MEMBRANE CONTAINING ZIRCONIUM PHOSPHATE

(57) Abstract: The present invention provides for a compound having the following structure:  $Zr(O_3PZ_qY_nX)_{2-m}(O_3PR)_m$ , wherein X = a functional group such as  $CO_2H$ ,  $PO(OH)_2$ , and  $SO_3H$ , and  $SO_2NHSO_2W$ , wherein W = aryl of 6 to 10 carbon atoms or Y; Y = perfluoro-linear, branched or cyclic alkylene group, wherein the alkylene is 1-20 carbon atoms, or a fluorinated group containing at least one substituent selected from the group consisting of oxygen, chlorine and bromine; Z = alkylene of 1-12 carbon atoms, aryl of 6-10 carbon atoms, or a heterocyclic aryl group of 3-10 carbons atoms; R = alkyl of 1-12 carbon atoms, aryl of 6-10 carbon atoms, substituted alkyl, or substituted aryl, wherein the substituent is selected from the group consisting of F, Cl, perfluoroalkyl, alkyl of 1-12 carbon atoms and aryl of 6-10 carbon atoms; n = 0 or 1; q = 0 or 1; and m = 0 to 1.5; with the proviso that when n = 0, and q = 1, Z = at least one heterocyclic group having 3 to 10 carbon atoms, 1 to 5 nitrogen atoms and 0 to 4 oxygen atoms. The invention also provides a polymer electrolyte membrane, a catalyst coated membrane and a fuel cell having this compound.